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DISCOVERY OF COMBINED NITROGEN IN STONY METEORITES (AËROLITES)

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In connection with my studies on microorganisms in stony meteorites described in American Museum Novitates No. 588, I had occasion to study the accounts available in published form of the nature and composition of those interesting accretions to our earth. I was surprised in such study to note that no data were available in regard to the total nitrogen content of stony meteorites. This observation made me wonder whether any combined nitrogen exists in meteorites, and I determined to make some analyses to discover the facts in the case. Seven specimens of stony meteorites were analyzed for this purpose and the results are given in the table which appears below. The determinations were made by the modified Gunning method in three cases, and by the Micro-Kjeldahl method in the other four cases. The results were as follows:

COMBINED NITROGEN IN STONY METEORITES

<i>Name of Meteorite</i>	<i>Percentage of Nitrogen</i>
American Museum of Natural History, No. 2416, Forest City, Iowa.....	.0052
Ward's Natural Science Establishment, Long Island, Phillips County, Kansas.....	.0064
Tilden Meteorite, Illinois.....	.0036
Ward's Natural Science Establishment, Gilgo No. 2, Brewar- rina, County Clyde, New South Wales (14.48 grams).....	.0048
Ward's Natural Science Establishment, Holbrook, Navajo County, Arizona (12.35 grams).....	.0016
Ward's Natural Science Establishment, Holbrook, Navajo County, Arizona (6.47 grams).....	.0025
Ward's Natural Science Establishment, Pultusk, Poland (4.32 grams).....	.0034

It is clear from the foregoing table that all the stony meteorites analyzed for nitrogen contain that element in combined form. While the percentage of nitrogen is in no case high, it is nevertheless of about one-tenth the magnitude of nitrogen in soils regarded as nitrogen-poor. Moreover, the Gunning or Kjeldahl method of analysis employed in this

study indicates that the nitrogen contained in these stony meteorites is probably there in the form of organic nitrogen. Tests made on the powder of three of these meteorites, for nitrates and nitrites, as well as ammonia, were all negative.

These analyses and observations are interesting in themselves as throwing light on the existence of a constituent in stony meteorites of which we have had no knowledge in them heretofore. But they are even more interesting and important in indicating that the nitrogen in question is in organic form; therefore lending more color to the thesis promulgated by me in another paper, *Novitates* No. 588, to the effect that living bacteria occur in stony meteorites. While the amount of nitrogen in these meteorites is small, it would be ample for furnishing a small bacterial population in the meteoritic substance with the nitrogen essential to their needs.